AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of all claims in the application.

Listing of Claims

Claims 1-32 **(Canceled)**

33. **(Currently amended)** An apparatus for analysis of a plurality of biochips, each biochip comprising an array of electrodes comprising capture binding ligands and an auxiliary electrode, the apparatus comprising:

a) a plurality of sets of stations wherein each set comprises:

i) a plurality of stations, each configured to receive at least one of said ~~the~~plurality of biochips, wherein each station comprises a plurality of array interconnects for electrical communication with said array of electrodes of a first biochip of said plurality of biochips and at least one auxiliary interconnect positioned for electrical communication with an auxiliary electrode of said first biochip;

ii a thermocontroller, ~~plurality of thermocontrollers, each~~ configured to independently thermally control one of said~~the~~ plurality of said sets ~~stations~~;

~~a plurality of interconnects positioned for electrical communication with the array of electrodes of a first biochip of the plurality of biochips and an auxiliary interconnect positioned for electrical communication with the auxiliary electrode of the first biochip;~~

b) a signal generator coupled to said plurality of array interconnects and said ~~the~~ auxiliary interconnect and configured to apply an input signal to said electrodes of said array of electrodes of said~~the auxiliary electrode in the~~ first biochip during an electrochemical measurement; and

c) a detector coupled to saidthe plurality of array interconnects and configured to receive an output signal from saida first electrodes of saidthe array of electrodes of saidthe first biochip during saidthe electrochemical measurement.

34. **(Currently amended)** An apparatus according to claim 33, wherein saidthe signal generator comprises a potentiostat configured to regulate a voltage between saidat the auxiliary electrode and said array of electrodes of said first biochip.

35. **(Currently amended)** An apparatus according to claim 34, wherein saidthe detector comprises a current detector configured to measure a current through the first electrode.

36. **(Canceled)**

37. **(Currently amended)** An apparatus according to claim 33, wherein saidthe first biochip further comprises a reference electrode, and said stationthe plurality of interconnects further includes a reference interconnect positioned for electrical communication with saidthe reference electrode, the reference interconnect coupled to the signal generator such that the input signal is adjusted based on a voltage measured by the reference electrode.

38. **(Currently amended)** An apparatus according to claim 33, further comprising a multiplexor coupled to saidthe detector and saidthe plurality of array interconnects, the multiplexor configured to identify a selected interconnect from saidthe plurality of array interconnects and couple saidthe selected interconnect to the detector.

39. **(Canceled)**

40. **(Currently amended)** An apparatus according to claim 33 further comprising a digital filter coupled to saidthe detector and configured to filter saidthe output signal.

41. **(Currently amended)** An apparatus according to claim 40 further comprising an analog to digital converter coupled to saidthe detector and at least one of saidthe first electrodes, saidthe analog to digital converter configured to digitize saidthe output signal.

42. **(Currently amended)** An apparatus according to claim 33, further comprising a first biochip inserted into a first station. wherein the first biochip comprises an electron transfer moiety and the input signal is selected based on at least a property of the electron transfer moiety.

43. **(Currently amended)** An apparatus according to claim 42, wherein said each electrode of said array of electrodes further comprises a self-assembled monolayer. the electron transfer moiety comprises ferrocene.

44. **(Currently amended)** An apparatus according to claim 4233, wherein at least one of said electrodes of said array of electrodes further comprises a hybridization complex comprising said capture binding ligand, a target, and a probe comprising an electron transfer moiety each electrode of the array of electrodes comprising comprises a self-assembled monolayer.

45. **(Currently amended)** An apparatus according to claim 44, wherein said electron transfer moiety comprises ferrocene.wherein each electrode of the array of electrodes further comprises capture binding ligands.

46. **(Cancelled)**

47. **(Currently amended)** An apparatus according to claim 33 wherein saidthe thermocontrollers comprises each comprise a temperature sensor and a temperature regulator.

48. **(Currently amended)** An apparatus according to claim 47 wherein at least one of saidthe temperature regulators comprise a Peltier thermal block.

49. **(Currently amended)** An apparatus according to claim 33 further comprising a processor coupled to at least one of said ~~the plurality of~~ thermocontrollers and configured to provide a control signal to said thermocontroller~~each of the plurality of thermocontrollers~~ for thermal regulation of its~~their~~ respective set. ~~station.~~

Claims 50-53 **(Canceled)**

54. **(New)** An apparatus for analysis of a plurality of biochips, each biochip comprising an array of electrodes comprising capture binding ligands and an auxiliary electrode, the apparatus comprising

a) a plurality of sets of stations wherein each set comprises:

i) a plurality of stations, each configured to receive at least one of said plurality of biochips, wherein each station comprises a plurality of array interconnects for electrical communication with said array of electrodes of a first biochip of said plurality of biochips and at least one auxiliary interconnect positioned for electrical communication with an auxiliary electrode of said first biochip;

b) a signal generator coupled to said plurality of array interconnects and said auxiliary interconnect and configured to apply an input signal to said electrodes of said array of electrodes of said first biochip during an electrochemical measurement; and

c) a detector coupled to said plurality of array interconnects and configured to receive an output signal from said electrodes of said array of electrodes of said first biochip during said electrochemical measurement.

55. **(New)** An apparatus according to claim 54, further comprising an active electrode select multiplexor coupled to said plurality of array interconnects of each station.

56. **(New)** An apparatus according to claim 54, further comprising a plurality of themocontrollers, each configured to independently thermally control one of said plurality of sets.

57. **(New)** An apparatus according to claim 55, further comprising an auxilliary electrode select multiplexor, said auxilliary electrode select multiplexor coupled to said signal generator and said plurality of auxilliary interconnects and configured to select at least one of said plurality of auxilliary interconnects as an active auxilliary interconnect and couple said active auxilliary interconnect to said signal generator.